

***FlyBy Math™* Alignment to
Mathematics Grade-Level Standards
Adopted April 2002**

Calculations and Estimations

Common Curriculum Goal (CCG): Numbers:

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Grade-Level Standards

M.08.1.A.1(2) Apply proportions to solve problems.

***FlyBy Math™* Activities**

--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Statistics and Probability

CCG: Collect and Display Data:

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Grade-Level Standards

M.08.2.C.1(1) Collect and display data as lists, tables, and plots using appropriate technology (e.g., graphing calculators, computer software).

***FlyBy Math™* Activities**

--Conduct simulation and measurement for several aircraft conflict problems.

--Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs.

CCG: Data Analysis and Predictions:

Develop and evaluate inferences and predictions that are based on data.

M.08.2.D.1(1) Estimate or predict the occurrence of future events using data.

--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.

Algebraic Relationships

CCG: Patterns and Functions:

Understand patterns, relations, and functions.

Grade-Level Standards

M.08.3.A.1(1) Represent, analyze and determine rules for finding patterns relating to linear functions, nonlinear functions and arithmetic sequences with tables, graphs, and symbolic rules.

***FlyBy Math™* Activities**

--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.

M.08.3.A.1(3) Interpret the meaning of the rate of change and y-intercept of a linear relationship in a problem setting.

--Interpret the slope of a line in the context of a distance-rate-time problem.

CCG: Algebraic Relationships:

Represent and analyze mathematical situations and structures using algebraic symbols.

Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.3.B.1(2) Approximate solutions of systems of linear equations from a graph.	<p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p>
M.08.3.B.1(4) Evaluate algebraic expressions and formulas, including expressions involving exponents and parentheses, by substituting rational numbers.	--Use the distance-rate-time formula to predict and analyze aircraft conflicts.
M.08.3.B.1(5) Translate between and interpret linear relationships represented by words, symbols, tables, and graphs.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
M.08.3.B.1(6) Determine the slope and x- and y-intercepts given the graph of a linear equation.	--Interpret the slope of a line in the context of a distance-rate-time problem.
M.08.3.B.1(7) Graph a linear equation given the slope and an initial value (y-intercept).	--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.
M.08.3.B.1(10) Identify and describe the effects of changing the slope or y-intercept on the graph of a linear relationship of the form $y=kx$ or $y=kx+b$.	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>
CCG: Modeling: Use mathematical models to represent and understand quantitative relationships.	
Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.3.C.1(1) Model situations, make predictions and inferences, and solve problems using linear equations and inequalities.	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p>
CCG: Change: Analyze change in various contexts.	
Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.3.D.1(1) Understand that the rate of change in a linear function is constant and is equal to the slope of its graphed line.	<p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>

M.08.3.D.1(2) Determine the slope of a line given two points on the line.	--Interpret the slope of a line in the context of a distance-rate-time problem.
M.08.3.D.1(3) Analyze the nature of change in quantities in linear relationships represented by graphs, tables, or formulas.	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates. --Interpret the slope of a line in the context of a distance-rate-time problem.

Measurement

CCG: Direct & Indirect Measurement:

Apply appropriate techniques, tools, and formulas to determine measurements.

Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.4.B.1(3) Solve problems involving rates and derived measurements for such attributes as speed, velocity, and density.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios. --Use the distance-rate-time formula to predict and analyze aircraft conflicts.

Geometry

CCG: Coordinate Geometry:

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.5.C.1(1) On a coordinate plane, determine the relative placement (e.g., intersecting, parallel, perpendicular) of two lines.	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.

Mathematical Problem Solving

CCG: Conceptual Understanding:

Select, apply, and translate among mathematical representations to solve problems.

Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.6.A.1(1) Interpret the concepts of a problem-solving task and translate them into mathematics.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
CCG: Processes and Strategies: Apply and adapt a variety of appropriate strategies to solve problems.	
Grade-Level Standards	<i>FlyBy Math™</i> Activities
M.08.6.B.1(1) Choose strategies that can work and then carry out the strategies chosen.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

CCG: Communication:

Communicate mathematical thinking coherently and clearly. Use the language of mathematics to express mathematical ideas precisely.

Grade-Level Standards

M.08.6.D.1(1) Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

FlyBy Math™ Activities

--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.

CCG: Accuracy:

Accurately solve problems that arise in mathematics and other contexts.

Grade-Level Standards

M.08.6.E.1(1) Accurately solve problems using mathematics.

FlyBy Math™ Activities

--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.